

REMARKS

By the present amendment, claims 1, 3 and 4 have been amended to, among other things, further clarify the concepts of the present invention and/or additionally distinguish over the cited patents. In addition, claim 2 has been cancelled. Entry of these amendments is respectfully requested.

In the Office Action, claims 1, 2 and 4-6 were rejected under 35 USC § 103(a) as being unpatentable over the newly cited patents to Yashiro and Steele et al. In making this rejection, it was asserted that the cited Yashiro patent teaches the work, method and device as claimed with the exception that it was acknowledged that the method of the patent does not teach (1) bending a material having the L- or U-shaped configuration as claimed nor (2) bending the material into a cylinder. As to the former (1), it was then asserted that a L- or U-shape is contained in the disclosed H-shape and thus it would be obvious to use either such shape. As to the latter (2), it was asserted that the Steele et al patent teaches this procedure. Reconsideration of this rejection in view of the above claim amendments and the following comments is respectfully requested.

Before discussing the rejection in detail, a brief review of the presently claimed invention may be quite instructive. The subject invention relates to bent work

manufactured by a method comprising (a) preparing a belt-shaped thick steel material having an L-shaped cross-section and having two elongated sides and two ends, and (b) forming a cylinder by bending the belt shaped thick steel material so that the ends of the belt-shaped thick steel material abut each other. Since the bent work is to be used as a bearing-receiving unit <sup>intended use</sup> for construction machinery, the cylinder having an L-shaped thick steel material is strong and has a superior appearance and still can be manufactured by one bending process. Further, the bent work having the above features can be manufactured according to the bending method and bending device according to the present invention. It is submitted that the patents to Yashiro and Steele et al, whether taken singly or in combination, fail to teach or suggest the bent work as recited in independent claim 1, the bending method as defined in independent claim 3 and the bending apparatus as defined in independent claim 4.

The patent to Yashiro relates to a method and apparatus for bending an H-shaped steel workpiece having a center web and two parallel flanges extending at right angles to and connected by the web in the plane of the web. The workpiece is bent by cold-bending in which a pressure roller 14 is brought into pressure-contact with the upper surface of the flange 11 (the upper flange in Fig. 1 and Fig. 5) of the workpiece and a pair of spaced pressure receiving rollers 14' and 14' are brought into pressure-contact with the lower surface of the flange 12 (the lower flange in Fig. 1 and Fig. 5) of the workpiece.

#1 However, the Yashiro patent does not teach or suggest, among other things, the formation of a cylinder of the H-shaped steel workpiece by cold-bending. In addition, the Yashiro patent does not teach that the bent work thereby obtained is used as a bearing-receiving unit for construction machinery. Therefore, it is submitted that the bending method and the bending device of the present invention are completely different from the method and apparatus of the Yashiro patent and the bent work manufactured by the present invention is also completely different from the bent work obtained by the Yashiro patent. It is submitted that these teaching deficiencies of the Yashiro patent are not supplied by the patent to Steele et al. *is teaching is not*

The patent to Steele et al teaches a steel band 22 used for an integral ABS exciter ring for cast iron hub. This steel band 22 is formed by bending a flat strip of steel into a circle thereby forming a cylinder. However, it is submitted that the bent work according to the presently claimed invention is completely different from the steel band 22 of the Steele et al patent and the bending method and the bending device of the present invention is also completely different from the method and apparatus of the Steele et al patent whether taken alone or in combination with the Yashiro patent. *no steps of bending are shown as compared*

More particularly, it was asserted in the Action that "At the time of the invention, it would have been obvious to one having ordinary skill in the art to modify the teachings of

#3 the Yashiro patent with the teachings of the Steele et al patent in order to produce the desired product (cylinder) of similar materials (steel)." However, it is not possible to form a cylinder as the steel band 22 of the Steele et al by bending the H-shaped steel workpiece by using the method and apparatus of the Yashiro patent. *may have a point*

Thus, one having ordinary skill in the art would not be led to form a cylinder as the steel band 22 of the Steele et al patent by bending the H-shaped steel workpiece by using the method and apparatus of the Yashiro patent.

Specifically, it is evident that problems such as corrugations or cranks may be caused on at least one or both of flanges 11 and 12 if a cylinder is formed by bending the H-shaped steel workpiece according to the Yashiro patent in which a pressure roller 14 is brought into pressure-contact with the upper surface of the flange of the workpiece and a pair of spaced pressure receiving rollers 14' and 14' are brought into pressure-contact with the lower surface of the flange 12 of the workpiece, because the length of the inner surface is different from that of the outer surface. In the meantime, the steel band 22 of the Steele et al patent may be regarded as a defective if the problem such as corrugations or cranks is caused on the inner surface thereof. From such circumstances, one having ordinary skill in the art would not combine the teachings of the Yashiro patent with those of the Steele et al patent. *may have a point*

In addition, bent work used as a bearing-receiving unit for construction machinery according to the present invention may be regarded as a defective if a problem such as corrugation or crank is caused on the inner surface thereof. Further, the same problem as in the case of using the H-shaped steel workpiece may be caused if a cylinder as the steel band 22 of the Steele et al patent is formed by bending the U-shaped steel workpiece instead of the H-shaped steel workpiece according to the method and apparatus of the Yashiro patent. According to the Yashiro patent, a pressure roller is brought into pressure-contact with the upper surface of the flange (e.g., the upper flange) of the workpiece and a pair of spaced pressure receiving rollers are brought into pressure-contact with the lower surface of the flange (e.g., the lower flange) of the workpiece.

Still further, the method and apparatus according to the Yashiro patent do not contemplate using an L-shaped steel workpiece instead of the H-shaped steel workpiece since the L-shaped steel workpiece does not have a pair of flanges (e.g., the both of the upper flange and the lower flange). Consequently, it is submitted that one having ordinary skill in the art at the time the invention was made would not be led to combine the cited patents in the manner as alleged in the Action.

For the reasons stated above, withdrawal of the rejections under 35 U.S.C. § 102(b) and § 103(a) and allowance of the claims as amended over the cited Yashiro and Steele

Serial Number: 09/705,750

et al patents are respectfully requested.

In view of the foregoing, it is submitted that the subject application is now in condition for allowance and early notice to that effect is earnestly solicited.

In the event this paper is not timely filed, the undersigned hereby petitions for an appropriate extension of time. The fee for this extension may be charged to Deposit Account No. 01-2340, along with any other additional fees which may be required with respect to this paper.

Respectfully submitted,

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PATENT TRADEMARK OFFICE

Marked Up Version of Amendments to Specification and Claims

IN THE CLAIMS:

1. (Amended) A bent work <sup>intended use</sup> used as a bearing-receiving unit for construction machinery and manufactured by a method comprising the steps of:

preparing a belt-shaped thick steel material having an L-shaped cross-section and having two elongated sides and two ends; and

forming a cylinder by bending the belt shaped thick steel material so that the ends of the belt-shaped thick steel material abut each other.

Cancel claim 2.

3. (Twice Amended) A bending method comprising the steps of:

providing a belt-shaped thick steel material having one of an L-shaped cross-section and a U-shaped cross-section and having two elongated sides and two ends; and

forming the material into a cylinder so that the ends of the belt-shaped thick steel material abut each other by using a center roller to be driven to rotate which is positioned and fixed in a predetermined position and a pair of bending rollers to be driven to rotate which is disposed opposing the center roller at one side of the center roller, movable toward and away from the center roller, the belt-shaped thick steel material having one of an L-shaped cross-section and a U-shaped cross-section being bent by being

transferred between the center roller and the pair of bending rollers, the bent work thereby obtained being used as a bearing receiving unit for construction machinery.

*intended use*

4. (Twice Amended) A bending device for bending a belt-shaped thick steel material having two elongated sides and two ends to form a cylinder where the ends of the belt-shaped thick steel material abut each other, <sup>*intended use*</sup> the bent work thereby obtained being used as a bearing receiving unit for construction machinery, the bending device comprising:

a center roller to be driven to rotate positioned and fixed in a predetermined position; and

a pair of bending rollers to be driven to rotate disposed opposing the center roller at one side of the center roller, movable toward and away from the center roller, the belt-shaped thick steel material being bent by being transferred between the center roller and the pair of bending rollers,

wherein the center roller is provided with an annular recess formed therein around the center roller, the pair of bending rollers are respectfully provided with annular convex portions formed thereon around the bending rollers, the convex portions to be inserted in the annular recess of the center roller at a predetermined position of the annular recess of the center roller, and the belt-shaped thick steel material having one of an L-shaped cross-section and a U-shaped cross-section is transferred between the center roller and the pair of bending rollers in a manner such that a concave portion of the belt-



Serial Number: 09/705,750

shaped thick steel member having one of an L-shaped cross-section and a U-shaped cross-section faces toward the outside at the annular recess of the center roller and the convex portions of the pair of bending rollers are positioned in the concave portion of the belt-shaped thick steel material having one of an L-shaped cross-section and a U-shaped cross-section.